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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,428	11/07/2003	Takuichi Arai	07057.0056	9393
7590 12/28/2004 Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P. 1300 I Street, N.W. Washington, DC 20005-3315			EXAMINER ZIMMER, MARC S	
			ART UNIT 1712	PAPER NUMBER

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/702,428

Applicant(s)

ARAI ET AL.

Examiner

Marc S. Zimmer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,9-16,19 and 20 is/are rejected.
- 7) ☒ Claim(s) 4,7-9 and 17-19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### ***Specification***

The Specification is objected to for its statement in paragraph 21 that "the structure being composed of silicon-oxygen bonds may be polycyclohexane." Clearly, polycyclohexane does not represent an embodiment of a structure having this constitution.

### ***Claim Objections***

Claim 4 is objected to because the relationship between the polymer and monomer delineated therein is not precisely delineated. This is a product of the vague phrase "polymer of a mixture". Applicant is encouraged to amend the language of claim 4 such that it reads, "polymer derived/prepared from a mixture".

Claims 9 and 19 are objected for its statement that the vinyl radical "contains" styrene when, in fact, styrene *is* the monomer having a vinyl radical.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 and 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Both claims 1 and 11 require the presence of a trialkylsilyl moiety but it is not clear given the wording employed as to whether said moieties are to be found at the ends of the backbone, or the ends of the grafted chains, or either, or both. According to paragraph 22 of the Specification, the aforementioned

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groups are located at the ends of the side chains hence claims 1 and 11 should be amended to reflect this more limiting description.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 4-6, 9-10, 14-16, and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Arimura, JP 2000-212305 A. Arimura discloses the preparation of ion-exchange membranes comprising some combination of the repeat units outlined in the formula on page 1 of the document. In a specific embodiment of the invention, Example 2 (paragraphs 52 and 53), the membrane comprises a polymer derived from vinyl triphenylsilane, p-methylstyrene, ethyl acrylate, vinyl sulfonic acid, and a crosslinking triazine-based compound. Alternatives to the vinyl triphenylsilane according to paragraph 22 include vinyl trethylsilane, and vinyl trimethylsilane. Alternatives to vinyl sulfonic acid according to paragraph 25 are styrene sulfonic acid, vinyl naphthyl sulfonic acid, and allyl sulfonic acid.

***Allowable Subject Matter***

Claims 7-8, and 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reference does not mention polymerizable silanes bearing two ethylenically-unsaturated groups nor does

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the prior art motivate one of ordinary skill to incorporate this monomer into the membrane(s) contemplated by Arimura.

Claims 1-3 and 11-13 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. WO 92-10528 A1 discloses a sulfonated polyorganosiloxane that possesses the required trialkylsilyl groups but the polymer is not a graft copolymer. JP 6-57205 A discloses a graft copolymer derived from a silicone macromonomer having polymerizable groups thereon, a vinyl monomer bearing phosphoric acid functional groups, and another vinyl monomer. Despite the presence of the phosphoric acid groups, there is no indication that the polymer is proton/cation/ion conducting.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc S. Zimmer whose telephone number is 571-272-1096. The examiner can normally be reached on Monday-Friday 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 23, 2004

*Mare Zimmer*

*Mare Zimmer*

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